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ENVIRONMENTAL IMPACT ASSESSMENT—AN INTRODUCTION[1, 2]

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The National Environmental Policy Act of 1969 (NEPA) presented scientists with new and exciting challenges for predicting and evaluating man-made impacts on the natural environment. It was quickly recognized that proper impact assessment requires interaction and understanding between numerous industrial, governmental, academic, and consulting organizations. It was also learned that valid impact assessment often requires that an interdisciplinary approach (e.g., a systems or problem-solving methodology) be employed because society can no longer afford the luxury of a strictly unidisciplinary or a multidisciplinary approach where duplication of resources such as space, time, equipment, monies, or manpower often results in fragmentary bits of information which cannot be used for understanding the system as a whole (Barrett *et al* 1976).

Partially as a result of NEPA, new fields of study, such as ecosystem analysis (Hammond 1972), resource science (Holling and Chambers 1973), systems theory (Becht 1974), stress ecology (Barrett *et al* 1976) and environmental science (Barrett and Puchy 1976), gained stature as vital new areas of study—areas which tended to merge the basic (liberal arts) and the applied (mission-oriented)schools of knowledge. Further, environmental manpower trends based on a traditional disciplinary input became somewhat antiquated, academic curricula required a new educational philosophy, and various organizations became involved in "re-tooling" personnel in "futuristic" impact assessment techniques and methodologies.

Because of these and other changes, the role of biologists in regard to impact assessment has become both a challenge and a subject of confusion during recent years. The papers presented in this symposium will attempt to outline the diversity of roles that biologists, especially ecologists and environmental scientists, now fulfill in an effort to achieve valid impact assessment. No attempt is made to cover the environmental "waterfront." Rather, the following articles presented by professionals from a systems, legal, governmental, consulting, aquatic, and terrestrial point of view—each author active in impact assessment—provide a diversity of roles, definitions, concepts, approaches, and guidelines for those interested in impact assessment opportunities and/or limitations.

Since the magnitude of complex environmental problems becomes more apparent each day, greater attention must be given to: (a) the process by which problems are solved, (b) the political role of scientists in interdisciplinary team-research activities, (c) the development and enrichment of new fields of specialization (e.g., energy, water resources, systems ecology, regional planning, and environmental health), (d) the personnel (manpower) needs in the years ahead, and (e) the most efficient and effective means to train those individuals interested in pursuing a career in the environmental arena. Hopefully, the following articles will help to illustrate the role that biologists will play in helping to solve many of the problems that presently confront society—problems that often fall within the impact assessment domain.

Finally, I would encourage the readers of the following articles to consider impact assessment as both an integrative, interdisciplinary methodology and as a potential

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[2]A symposium held 28 February 1976 at Battelle Memorial Auditorium, Columbus, OH.

new field of environmental pursuit. An interdisciplinary assessment of man-made impact on natural systems should help to integrate man into an ecosystem concept. Impact assessment should also serve as a vital focal point for further academic, governmental, and industrial interaction. Such interaction should assist in the development of ecological theory, provide the university with an important role in helping to find solutions to complex environmental problems, and provide diverse on-the-job training and research opportunities for a wide array of environmental scientists.

Already seminars, courses, research activities, and symposia have been developed around the impact assessment theme. In the future, interuniversity and interorganizational programs will probably follow due to the urgent need to better understand man's environmental impact on our vital natural systems.

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